

In the Claims

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3 1. (Currently Amended) An apparatus, comprising:
4 a fuel cell for producing a flow of electric charges from a fuel;
5 an electric charge counter coupled with the fuel cell, wherein counted
6 electric charges are proportional to an amount of the fuel used in the fuel cell to
7 produce the counted electric charges, wherein the electric charge counter:

8 counts electric charges by integrating the flow of electric charges
9 with respect to time;

10 counts electric charges by measuring a voltage proportional to a flow
11 rate of the electric charges and by assigning a frequency to the voltage;

12 varies the frequency in proportion to changes in the flow rate of the
13 electric charges over time; and

14 increments the count of the electric charges at an incrementing rate
15 proportional to the frequency; and

16 a display coupled with the electric charge counter to show an amount of the
17 fuel based on corresponding counted electric charges.

18 2. (Original) The apparatus as recited in claim 1, wherein the display
19 shows an amount of fuel used by the fuel cell based on the counted electric
20 charges.

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22 3. (Original) The apparatus as recited in claim 1, further comprising a
23 fuel supply, wherein the display shows an amount of fuel remaining in the fuel
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1 supply after subtracting the amount of fuel corresponding to the counted electric
2 charges.

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4 4. (Cancelled)

5 5. (Cancelled)

6 6. (Cancelled)

7 7. (Cancelled)

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9 8. (Original) The apparatus as recited in claim 1, wherein the electric
10 charge counter includes an interpreter to determine a proportionality factor
11 between the counted electric charges and the amount of fuel used to produce the
12 counted electric charges.

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14 9. (Original) The apparatus as recited in claim 8, further comprising a
15 temperature compensator, wherein the amount of fuel shown on the display is
16 corrected for a temperature if the temperature affects the proportionality between
17 the quantity of counted electric charges and the amount of fuel used to produce the
18 counted electric charges.

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20 10. (Original) The apparatus as recited in claim 8, further comprising a
21 pressure compensator, wherein the amount of fuel shown on the display is
22 corrected for a pressure if the pressure affects the proportionality between the
23 quantity of counted electric charges and the amount of fuel used to produce the
24 counted electric charges.
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2 11. (Original) The apparatus as recited in claim 8, further comprising a
3 fuel loss compensator, wherein the amount of fuel shown on the display is
4 corrected if a fuel loss affects the proportionality between the quantity of counted
5 electric charges and the amount of fuel used to produce the counted electric
6 charges.

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8 12. (Original) The apparatus as recited in claim 8, further comprising a
9 fuel mix compensator, wherein the amount of fuel shown on the display is
10 corrected if a fuel mix affects the proportionality between the quantity of counted
11 electric charges and the amount of fuel used to produce the counted electric
12 charges.

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14 13. (Original) The apparatus as recited in claim 8, further comprising a
15 self-calibrator to determine, while counting electric charges during fuel use, the
16 proportionality between the counted electric charges and the amount of fuel used
17 to produce the counted electric charges.

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19 14. (Original) The apparatus as recited in claim 13, wherein the self-
20 calibrator performs automatic determination of the proportionality.

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22 15. (Original) The apparatus as recited in claim 8, further comprising a
23 fuel comparator to determine electric charge counts for equivalent amounts of
24 different types of fuel.
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2 16. (Currently Amended) A fuel cell, comprising:
3 a means for converting a fuel into a flow of electric charges, wherein the
4 quantity of electric charges produced over time is proportional to the quantity of
5 fuel molecules converted;

6 a means for counting the electric charges in the flow, wherein:

7 the means for counting the electric charges integrates the flow of
8 electric charges with respect to time;

9 the means for counting the electric charges measures a voltage
10 proportional to the flow of the electric charges and assigns a frequency to
11 the voltage;

12 the means for counting electric charge varies the frequency in
13 proportion to changes in the flow rate of electric charges over time; and

14 the electric charge counter increments the count of the electric
15 charges at an incrementing rate proportional to the frequency; and

16 a means for displaying an amount of fuel molecules converted.
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18 17. (Original) The fuel cell as recited in claim 16, wherein the means for
19 displaying shows the amount of fuel molecules converted as an amount of fuel
20 from a fuel supply.
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22 18. (Original) The fuel cell as recited in claim 17, wherein the means for
23 displaying shows the amount of molecules converted as an amount of fuel
24 remaining in a fuel supply.
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19. (Cancelled)

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22. (Cancelled)

23. (Original) The fuel cell as recited in claim 16, wherein the means for counting electric charges measures an overall power output of the fuel cell over time when connected to a particular electrical load and correlates the overall power output of the fuel cell over time to the quantity of fuel molecules converted using an efficiency factor of the fuel cell when connected to the particular electrical load.

24. (Original) The fuel cell as recited in claim 16, wherein the means for counting electric charges includes a means for determining a proportionality between the count of the electric charges and the quantity of fuel molecules converted.

25. (Original) The fuel cell as recited in claim 24, wherein the means for determining a proportionality further comprises a temperature compensator.

26. (Original) The fuel cell as recited in claim 24, wherein the means for determining a proportionality further comprises a pressure compensator.

1 27. (Original) The fuel cell as recited in claim 24, wherein the means for
2 determining a proportionality further comprises a fuel loss compensator.

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4 28. (Original) The fuel cell as recited in claim 24, wherein the means for
5 determining a proportionality further comprises a fuel mix compensator.

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7 29. (Original) The fuel cell as recited in claim 24, wherein the means for
8 determining a proportionality further comprises a self-calibrator to determine the
9 proportionality while counting electric charges during fuel use.

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11 30. (Original) The fuel cell as recited in claim 29, wherein the self-
12 calibrator performs automatic determination of the proportionality.

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14 31. (Original) The fuel cell as recited in claim 16, further including a
15 fuel comparator to determine electric charge counts from equivalent amounts of
16 different types of fuel.

1 32. (Currently Amended) A fuel supply system, comprising:
2 a fuel container for holding a remaining amount of fuel;
3 an electric charge counter to count an electric charge content of an amount
4 of fuel taken from the fuel container, wherein the count of the electric charge
5 content is proportional to the amount of the fuel taken from the fuel container,
6 wherein the electric charge counter:

7 counts electric charges by measuring a voltage proportional to a flow
8 rate of the electric charges and by assigning a frequency to the voltage;

9 varies the frequency in proportion to changes in the flow rate of the
10 electric charges over time; and

11 increments the count of the electric charges at an incrementing rate
12 proportional to the frequency; and

13 a display to show the remaining amount of fuel in the fuel container.

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15 33. (Original) The fuel supply system as recited in claim 32, wherein the
16 electric charge content is counted during oxidation of the fuel by a fuel cell.

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18 34. (Original) The fuel supply system as recited in claim 32, wherein the
19 fuel comprises fuel molecules, and each fuel molecule contributes a constant
20 number of electric charges to the count of the electric charge content.
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1 35. (Currently Amended) A fuel gauge, comprising:
2 a charge counter to count electrical charges produced in a fuel cell by a fuel
3 from a fuel supply, wherein the electric charge counter:
4 counts electric charges by measuring a voltage proportional to a flow
5 rate of the electric charges and by assigning a frequency to the voltage;
6 varies the frequency in proportion to changes in the flow rate of the
7 electric charges over time; and
8 increments the count of the electric charges at an incrementing rate
9 proportional to the frequency; and
10 a display to show an amount of the fuel based on the counted electrical
11 charges.

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13 36. (Original) The fuel gauge as recited in claim 35, wherein the amount
14 of the fuel displayed is an amount of the fuel that has been used from the fuel
15 supply.

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17 37. (Original) The fuel gauge as recited in claim 35, wherein the amount
18 of the fuel displayed is an amount of the fuel remaining in the fuel supply.

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20 38. (Withdrawn) A count interpreter for a charge counting fuel gauge,
21 comprising:
22 a count calibrator; and
23 a fuel loss compensator.
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1 39. (Withdrawn) The count interpreter as recited in claim 38, wherein
2 the count calibrator further includes a temperature compensator to adjust a display
3 of a fuel amount if a charge count is affected by a temperature.
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5 40. (Withdrawn) The count interpreter as recited in claim 38, wherein
6 the count calibrator further includes a pressure compensator to adjust a display of
7 a fuel amount if a charge count is affected by a pressure.
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9 41. (Withdrawn) The count interpreter as recited in claim 38, wherein
10 the count calibrator further includes a fuel mix compensator to adjust a display of
11 a fuel amount if a charge count is affected by a fuel mix.
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13 42. (Withdrawn) The count interpreter as recited in claim 38, wherein
14 the fuel loss compensator adjusts a fuel amount to be displayed by an amount of
15 fuel that does not contribute to a charge count.
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17 43. (Withdrawn) The count interpreter as recited in claim 38, further
18 comprising a self-calibrator to find a relationship between an amount of fuel and a
19 quantity of electric charges counted during use of a fuel that produces electric
20 charges in a fuel cell.
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22 44. (Withdrawn) The count interpreter as recited in claim 38, further
23 comprising a fuel comparator to determine a quantity of electric charges yielded
24 by same amounts of different fuels.
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2 45. (Currently Amended) A method, comprising:
3 producing electric charges in a fuel cell using a fuel;
4 counting the electric charges to determine an amount of the fuel used to
5 produce the electric charges, wherein counting the electrical charges comprises:
6 measuring a voltage proportional to a flow rate of the electric
7 charges and by assigning a frequency to the voltage;
8 varying the frequency in proportion to changes in the flow rate of the
9 electric charges over time; and
10 incrementing the count of the electric charges at an incrementing
11 rate proportional to the frequency; and
12 displaying the amount.
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14 46. (Original) The method as recited in claim 45, wherein the producing
15 electric charges using a fuel includes producing a number of electric charges for
16 each molecule of fuel, wherein the number is a constant.
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18 47. (Original) The method as recited in claim 45, wherein the electric
19 charges are obtained from an oxidation reaction of the fuel.
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1 48. (Currently Amended) A method, comprising:
2 connecting an electric charge counter to a fuel cell, wherein the fuel cell
3 produces electric charges from a fuel;
4 counting the electric charges, wherein counting the electrical charges
5 comprises:
6 measuring a voltage proportional to a flow rate of the electric
7 charges and by assigning a frequency to the voltage;
8 varying the frequency in proportion to changes in the flow rate of the
9 electric charges over time; and
10 incrementing the count of the electric charges at an incrementing
11 rate proportional to the frequency; and
12 displaying an amount of fuel corresponding to the counted electric charges.

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14 49. (Original) The method as recited in claim 48, further comprising
15 displaying an amount of fuel remaining in a fuel supply after an amount of fuel
16 corresponding to the counted electric charges has been subtracted from the fuel
17 supply.

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19 50. (Original) The method as recited in claim 48, further comprising
20 determining a proportionality factor between a quantity of the counted electric
21 charges and an amount of fuel used by the fuel cell.
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